

Claims:

1. A method for establishing a digital hybrid subscriber connection
5 consisting of an optical fiber and a subscriber-specific metallic pair cable, whereby
(a) a subscriber connection comprises an optical fiber (2), a metallic pair cable (4),
and equipment (103) adapting said optical fiber and cable to each other so that the
optical fiber goes towards a central site and the pair cable goes towards a subscriber,
(b) a subscriber's transmission device (5) is connected to the metallic pair cable of
10 the respective subscriber at the subscriber end of the pair cable, (c) a subscriber-
specific first analog or digital information stream, intended for each subscriber, is
transported over the optical fiber (2), and (d) a second information stream, produced
by each subscriber, is transported in analog or digital form over the optical fiber (2)
from said equipment (103) to the central site,
15 the method comprising the steps of adapting said equipment (103)
 - for converting the first optical analog or digital information stream of
each subscriber, transported over the optical fiber and intended for the respective
subscriber, into electrical form and transmitting said first analog electric signal over
the pair cable (4) to the subscriber's transmission device (5) and
20 - for converting a subscriber-specific second analog electric signal,
transmitted by each subscriber's transmission device (5) over said pair cable (4), into
an analog or digital optical signal and feeding this second information stream further
over the optical fiber to the central site, and
further comprising the step
25 - of multiplexing the first and second digital or analog optical
information stream of several subscribers into one or more optical fibers (2) in both
transmission directions,
characterized by
 - inserting subscriber-specific conversion elements (105) into said
30 equipment (103), said elements to comprise active electronics which are adapted to
separate each subscriber-specific optical analog or digital first information stream
from other subscribers' first information streams and to convert said first information
stream into an analog electric first signal, and further to feed said first signal over the

respective pair cable (4) to the subscriber's transmission device (5), and adapted to convert each subscriber-specific analog second signal transmitted by the subscriber's transmission device (5) over the respective pair cable (4) into an optical analog or digital second information stream,

- 5 - multiplexing the first information streams at the central site onto the optical fiber (2) by utilizing such multiplexing method so that (i) said subscriber-specific first information streams can be distributed to each subscriber's conversion element (105) by means of passive optical elements, and so that (ii) said transmission element (105) of each subscriber is able to separate the first information stream,
- 10 intended for the respective subscriber, from other subscribers' first information streams,
 - adapting said equipment (103) to distribute the optical analog or digital first information streams to the conversion element (105) of each subscriber by means of passive optical elements,
- 15 - adapting said equipment (103) to combine the optical analog or digital second information streams of all subscribers and to feed the combined second information streams into the optical fiber (2) by means of passive optical elements,
 - adapting said conversion elements (105) to operate independently so that each conversion element (105) is capable of operating without being dependent on the state of operation of other subscribers' conversion elements, and
 - feeding the operating electric power through the pair cable (4) of each subscriber to the user-specific conversion elements contained in said equipment (103).
- 25 2. A method according to claim 1, characterized by
 - adapting each subscriber's transmission equipment (5) to feed direct electric current into the metallic pair cable of respective subscriber and
 - inserting a power-generating element (15) into the subscriber-specific conversion element (105) and adapting said power-generating element (15) to produce the operating electric power for the conversion element (105) from the direct electric current which is fed through the pair cable (4).
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3. A system for establishing a digital subscriber connection, consisting of a composition of an optical fiber and a metallic pair cable, in which system (a) a subscriber connection comprises an optical fiber (2), a metallic pair cable (4), and equipment (103) adapting said fiber and pair cable to each other so that the optical fiber goes towards a central site and the pair cable goes towards a subscriber, (b) in which system a subscriber's transmission device (5) is connected to the metallic pair cable (4) of each subscriber, (c) the system comprising first transmission elements for transporting a first information stream, intended for each subscriber, over the optical fiber (2) in analog or digital form from the central site to said equipment (103), and (d) the system comprising second transmission elements for transporting a second information stream, produced by each subscriber, in analog or digital form over the optical fiber (2) from said equipment (103) to the central site, and

- means for converting the analog or digital first information stream, intended for the subscriber, into electric analog form, and for feeding this analog first signal to the subscriber's transmission device (5) over the pair cable (4), and also

- means for converting a second electric analog signal, which is transmitted by the subscriber's transmission device (5) and transported over the pair cable (4), into an optical signal in analog or digital form, and for transmitting this second information stream over the optical fiber to the central site, and

- means for multiplexing the first and second analog or digital information streams of several subscriber connections onto one or more optical fibers (2) in both transmission directions,

characterized in that

- said equipment (103) consists of subscriber-specific conversion elements (105) comprising active electronics, which separate each subscriber-specific optical analog or digital first information stream from other subscribers' first information streams, convert said first information stream into an analog electric first signal, further transmit said first signal over the respective pair cable (4) to the subscriber's transmission device (5), and convert each subscriber-specific analog second signal transmitted by the subscriber's transmission device (5) over the respective pair cable (4) into an optical analog or digital second information stream,

- the system comprises means for multiplexing the first information streams at the central site onto the optical fiber (2) by utilizing a multiplexing

method whereby (i) said subscriber-specific first information streams can be distributed to each subscriber's conversion element (105) by means of passive optical elements and (ii) said transmission element (105) of each subscriber is able to separate the first information stream, intended for the respective subscriber, from other subscribers' first information streams,

- said equipment (103) comprises means for distributing the optical analog or digital first information streams to the conversion element (105) of each subscriber by means of passive optical elements,
- said equipment (103) comprises means for combining the optical analog or digital second information streams of all subscribers and feeding the combined second information streams into the optical fiber (2) by means of passive optical elements,
- said conversion elements (105) operate independently so that each conversion element (105) is capable of operating without being dependent on the state of operation of other subscribers' conversion elements, and
- the operating electric power is fed through the pair cable (4) of each subscriber for the user-specific conversion elements contained in said equipment (103).

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4. A method according to claim 3, characterized in that

- each subscriber's transmission equipment (5) comprises means for feeding direct electric current into the metallic pair cable (4) of said subscriber, and
- a user specific conversion element (105), included in said equipment (103), contains a power-generating element (15) for producing the operating electric power for the conversion element (105) from the direct electric current, which is fed through the pair cable (4).